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RETTIG, ULE,¹⁰ and others, all of which are out of harmony with the myrmecophile hypothesis. The work of NIEUWENHUIS-UEXKÜLL confirms these more recent views.

After a detailed account of extra-floral nectaries by plant families, the author summarizes the data presented, and some of the chief conclusions follow. The structure and form of the nectaries do not favor the theory that they originated as adaptations for ant protection; in many cases they specifically oppose such an assumption, and their position on the plant (largely on the leaf undersurface) is such as to be of no purposive significance. The secretions often begin late in life, so that the plant is without protection in youth, when it is most needed. In other cases the secretion begins in early youth and soon ceases, thus leaving the plant for a long time without ant protection, if such exists. The nectaries usually secrete sugar somewhat spasmodically during their period of activity, and are often dry. The nectar of many species is avoided by ants and other animals. The view that the honey-seeking ants drive off crawling insects and other "unbidden guests" that mutilate the flowers, robbing them of honey or pollen, is quite untenable, there being no relation between mutilated flowers, ants, and extra-floral nectaries. Floral mutilation depends on the structure and position of the flower or the weather; furthermore, most mutilated flowers produce as many seeds as flowers that are not mutilated. The honey-seeking ants are not combative and do not attack other insects on the plants they visit; indeed, these other insects often attack and repel the ants. The nectaries, therefore, so far from being beneficial structures developed by natural selection, are harmful to the plants of which they are a part, in that they attract insects of all kinds, which not only eat the sugar but do harm in various ways. Observation showed that individual plants which secreted little or no nectar are less harmed by insects than are those that produce nectar.

This paper, in addition to other recent work, makes it clear that myrmecophily is a figment of the imagination, and the word should be dropped from botanical literature. Ants may "love" plants, but there is no evidence that plants "love" ants. Plants inhabited by these insects, if it seems worth while to group them, may be called myrmecophytes.—H. C. COWLES.

A Mendelian ratio and latency.—SHULL¹¹ in a suggestive paper makes further contributions to Mendelian theory. In certain bean hybrids three distinct units were shown in earlier papers¹² to be involved, namely, a pigment factor, a blackener, and a mottled pattern. In the last character a peculiar condition is found, namely, the mottled pattern depends upon the presence of a mottling allelo-

¹⁰ See BOT. GAZETTE 44:314. 1907.

¹¹ SHULL, GEO. H., A new Mendelian ratio and several types of latency. Amer. Nat. 42:433-451. 1908.

¹² ———, The significance of latent characters. Science 25:792. 1907; Some latent characters of a white bean. *Idem* 25:828. 1907.

morph in a *heterozygous* condition, the homozygous giving unmottled seeds. This peculiarity results in a new ratio, 18:18:6:6:16, instead of the anticipated 27:9:9:3:16. Latency is held to mean invisibility and not inactivity or dormancy. BATESON's "presence and absence" hypothesis, in which the presence of any character is said to be dominant to its absence, is believed to be of general validity; and his¹³ more recent terms "epistatic" and "hypostatic," as applied to the capacity of one unit to hide or be hidden by another, are accepted. Thus in MENDEL's original case, yellow in cotyledons is not to be considered "dominant" over green, but dominant to the absence of yellow and "epistatic" to green, i. e., according to SHULL, causing its "invisibility" but not its "inactivity." This change of view involves some nice distinctions, but appears to obviate some of the difficulties of the older view of dominance, especially in connection with ontogeny. Incidentally all that remains of the Mendelism of MENDEL is his hypothesis of gametic purity. The superstructure erected upon this has grown in complexity with great rapidity.

With latency thus clearly defined, four types of latency are discussed: (1) "*Latency due to separation*, in which an allelomorph when acting alone has no external manifestation, and is only rendered patent by combining it with another allelomorph." This type of latency is not uncommon, and gives rise to such ratios as 9:3:4, 9:7, 27:9:28. (2) "*Latency due to combination*, in which two dominant allelomorphs, each giving rise to a peculiar character when acting alone, lose their external manifestation when coexisting in the same zygote." This gives the ratio first mentioned above in mottled beans, and may account for certain "mid-races." (3) "*Latency due to hypostasis*, in which the presence of one allelomorph cannot be detected owing to the presence of another allelomorph, the character produced by the latter being unmodified by the activity of the former." For example, a black bean is shown to hide a distinct-brown allelomorph, and a dark orange bean to carry invisibly a light-yellow allelomorph. This condition may give such a ratio as 12:3:1. (4) *Latency due to fluctuation*. Disappearance of characters under unfavorable conditions of nutrition, etc.; a very common phenomenon which may cause discrepancies from the expected ratio. Some of the cases formerly called "incomplete or partial dominance" would probably be classed here. Ratios may also rarely be modified by the failure of certain allelomorph combinations to form a zygote which will develop.—R. R. GATES.

Respiratory chromogens.—PALLADIN¹⁴ has devised a new, very simple, and effective method of detecting the respiratory chromogens in plants. He uses this method to show the wide distribution of these chromogens in the plant kingdom. In 71 species, ranging from liverworts to dicotyledons, this method showed these

¹³ BATESON, WILLIAM, Facts limiting the theory of heredity. *Science* 26:649-660. 1907.

¹⁴ PALLADIN, W., Die Verbreitung der Atmungskromogene bei den Pflanzen. *Ber. Deutsch. Bot. Gesells.* 26a:378-389. 1908.